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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,771	09/08/2003	Raymond Bernard Edelman	7784-000312DVA	3954

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EXAMINER

MCDONALD, RODNEY GLENN

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 06/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/657,771

Applicant(s)

EDELMAN ET AL.

Examiner

Rodney G. McDonald

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

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DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 6, 7 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Few et al. (U.S. Pat. 5,404,712) in view of Bussing (U.S. Pat. 6,062,018).

Regarding claim 1, Few et al. teach a device for optically initiating a combustion reaction from an air/fuel supply. (See Abstract) Fig. 1 shows the device having an optical energy source in the form of a laser 12. A combustion chamber 22 is present having a fuel injector 24 for providing the fuel/air mixture 26 to the combustion chamber. A device in the form of an optical fiber 16 provided the optical energy to the combustion

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chamber. (Column 3 lines 60-68; Column 4 lines 1-21) Combustion occurs in the combustion chamber.

Regarding claim 6, the optical energy includes a laser. (Column 3 lines 60-68; Column 4 lines 1-21)

Regarding claim 7, the transfer device includes a fiber optic. (Column 4 line 2)

Regarding claim 9, the output includes light. (Column 7 lines 64-68)

Regarding claim 10, the light includes a laser beam. (Column 7 lines 64-68)

Regarding claim 11, the light is **approximately** 0.3 micrometers. (Column 7 line 68) Here approximately is to interpreted to be around 0.3 micrometers which would indicate some values less than 0.3 micrometers as required by Applicant's claim 11.

Regarding claim 12, as to wherein said output is greater than one (1) Megawatt, the output is a result-effective variable and one skilled in the art has the skill to calculate the output that would determine the success of the desired reaction to occur, i.e., initiating the combustive reaction, absent evidence to the contrary. MPEP 2141 .03 and 2144.05(b).

Regarding claim 13, the combustion yields a dissociated mixture. (Column 4 lines 61-68; Column 5 lines 1-14)

Regarding claim 14, the combustion reaction would inherently yield molecular and atomic oxygen as well as cracked fuel.

The difference between Few et al. and the present claims is that the use of a slurry as the fuel is not discussed.

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Regarding the use of a slurry as the fuel, Bussing teach that pulse detonation combustion system can combust fuels such as coal, coal slurry, natural gas and other liquid hydrocarbons. (Column 2 lines 30-35)

The motivation for utilizing a coal slurry is that it allows for combustion of such a fuel. (Column 2 lines 30-37)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Few et al. by utilizing a coal slurry as taught by Bussing because it allows for combustion of such a fuel.

Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Few et al. in view of Bussing as applied to claims 1, 6, 7, 9-14 above, and further in view of Nishida et al. (Japan 57-200672).

The differences not yet discussed is the output having a pulse that has a leading edge and trailing edge where the leading edge has a higher power than the trailing edge, where the output includes a first and second pulse the first pulse having a higher power than the second pulse, the first pulse being injected in a predetermined time period prior to the second pulse and the predetermined time period being ten nanoseconds.

Regarding the output having a pulse that has a leading edge and trailing edge where the leading edge has a higher power than the trailing edge, where the output includes a first and second pulse the first pulse having a higher power than the second pulse, Nishida et al. teach applying a laser beam to combust an air-fuel mixture utilizing a first pulse of laser beam having a high energy density and utilizing a second low

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energy density pulse for igniting the air fuel mixture reliably. (See Abstract) From Fig. 4(B) the first pulse has a leading edge and trailing edge. The second pulse is at a lower energy than the first pulse. (See Fig. 4(B))

Regarding the output including a first and second pulse the first pulse having a higher power than the second pulse, as seen in Fig. 4(B) and discussed in the abstract the first pulse has a higher energy than the second pulse. (See Abstract; Fig. 4(B)).

Regarding the first pulse being injected in a predetermined time period prior to the second pulse and the predetermined time period being ten nanoseconds, the first pulse is injected at a first predetermined time period. (see Abstract; Fig. 4(B)) Few et al. discussed above teach pulsing between 5-50 nanoseconds. (See Few et al. discussed above)

The motivation for utilizing an output having a pulse that has a leading edge and trailing edge where the leading edge has a higher power than the trailing edge, where the output includes a first and second pulse the first pulse having a higher power than the second pulse, the first pulse being injected in a predetermined time period prior to the second pulse and the predetermined time period being ten nanoseconds is that it allows for igniting the air fuel mixture in a reliable manner. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized an output having a pulse that has a leading edge and trailing edge where the leading edge has a higher power than the trailing edge, where the output includes a first and second pulse the first pulse having a higher power than the second pulse, the first pulse being injected in a predetermined time

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period prior to the second pulse and the predetermined time period being ten nanoseconds as taught by Nishida et al. because it allows for igniting the air fuel mixture in a reliable manner.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Few et al. in view of Bussing as applied to claims 1, 6, 7, 9-14 above, and further in view of Firnberg et al. (U.S. Pat. 5,374,405).

The difference not yet discussed is the use of a fiber optic bundle.

Firnberg et al. teach the use of a fiber optic bundle for a combustion bed. The energy source for the radiation can be located outside of the bed and directed into the bed with an appropriate optical arrangement. For example, solar flux can be concentrated and directed into the bed with a series of mirrors and/or through the use of a fiber optic bundle. (Column 6 lines 22-27)

The motivation for utilizing a fiber optic bundle is that it allows directing of radiation into a combustion reactor. (Column 6 lines 22-27)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a fiber optic bundle as taught by Firnberg et al. because it allows for directing radiation into a combustion reactor.

Claims 15 and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Few et al. in view of Bussing and further in view of Hunt et al. (U.S. Pat. 6,385,963).

Few et al. in view of Bussing is discussed above and all is as applies above.
(See Few et al. in view of Bussing)

The difference between Few et al. in view of Bussing and the present claims is that the use of an optical wavelength filter is not discussed.

Hunt et al. teach providing optical energy to a combustion chamber that utilizes a wavelength filter for selecting the wavelength to be conveyed to the chamber. (Column 4 lines 7-12)

The motivation for utilizing an optical filter is that it allows for selecting the wavelength to be conveyed to the chamber. (Column 4 lines 7-12)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized an optical filter as taught by Hunt et al. because it allows for selecting the wavelength to be conveyed to the chamber.

Claims 16-20 and 26-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Few et al. in view of Bussing and further in view of Hunt et al. as applied to claims 15 and 21-25 above, and further in view of Nishida et al. (Japan 57-200672).

The difference not yet discussed is the use of an intensity profiler.

Nishida et al. intensity profiler in the form of an oscillator, which controls the laser to provide pulses to a fuel air mixture. The first pulse being of higher energy than the second pulse such that the mixture can be ignited in a reliable manner. (See Nishida Abstract; Nishida discussed above)


The motivation for utilizing an intensity profiler is that it allows for pulsing at a first high energy and then a low energy in order to ignite the air fuel mixture in a reliable manner. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized an intensity profiler as taught by Nishida et al. because it allows for pulsing at a first high energy and then at a low energy in order to ignite the air fuel mixture in a reliable manner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
June 6, 2005